

PATENTS  
Attorney Docket No. NTK-006.01

**IN THE CLAIMS:**

- 1 1. (Canceled)
- 1 2. (Currently amended) The method of claim ~~163~~, wherein the storage time is based on one  
2 or more of: an actual time, a time interval, and an event.
- 1 3. (Currently amended) The method of claim ~~161~~, further comprising:  
2 prior to detecting changed locations, generating a baseline image, where the baseline  
3 image includes at least the one or more data files.
- 1 4. (Original): The method of claim 3, wherein generating a baseline image includes:  
2 generating one or more of: a volume image, a file image, and a snapshot image.
- 1 5. (Currently amended) The method of claim ~~161~~, wherein detecting changed locations  
2 includes:  
3 at a time prior to the storage time,  
4 generating a baseline image of at least the one or more data files, and,  
5 using one or more data integrity procedures to generate a summary of the  
6 baseline image;  
7 thereafter,  
8 generating a second image of at least the one or more data files, and,  
9 using the one or more data integrity procedures to generate a summary of the  
10 second image; and,  
11 based on the baseline summary and the second summary, determining whether the  
12 one or more data files includes changed locations.
- 1 6. (Original): The method of claim 5, wherein the one or more data integrity procedures  
2 include one or more of: a cyclic redundancy check procedure and an MD5 procedure.

PATENTS  
Attorney Docket No. NTK-006.01

1 7. (Canceled)

1 8. (Canceled)

1 9. (Canceled)

1 10. (Currently amended) The method of claim ~~161~~, wherein storing the contents includes:  
2 selecting at least one memory to store the contents.

1 11. (Original): The method of claim 10, wherein selecting at least one memory includes:  
2 selecting the at least one memory to be distinct from a previously selected memory  
3 associated with a prior storage time.

1 12. (Canceled)

1 13. (Currently amended) The method of claim ~~163~~, wherein ~~associating~~ providing the  
2 associations includes:  
3 generating one or more indexes to associate: the stored contents, the respective  
4 storage times, the respective changed locations, and ~~the respective one or more~~ respective  
5 file identifiers.

1 14. (Original): The method of claim 13, wherein the one or more indexes include:  
2 a first index to the changed locations based on the one or more file identifiers, and  
3 a second index to the stored contents based on the changed locations.

1 15. (Currently amended) The method of claim ~~161~~, further comprising:  
2 using the stored contents to create a version of a selected one of the one or more data  
3 files.

PATENTS  
Attorney Docket No. NTK-006.01

1 16. (Currently amended) The method of claim 15, wherein using the stored contents to  
2 create a version includes:

3 for each of one or more storage times associated with the version, ~~and based on the~~  
4 ~~file identifier associated with the selected data file:~~ querying one or more indexes that  
5 associate the stored contents, the respective storage times, the respective changed locations,  
6 and ~~the respective one or more~~ respective file identifiers, to identify stored contents and  
7 respective changed locations associated with the selected data file, and

8 combining the identified stored contents with data from a baseline image associated  
9 with the selected data file.

1 17. (Original): The method of claim 16, wherein querying includes:

2 determining that the changed locations are the same for two or more different storage  
3 times, and,

4 identifying the stored contents of the changed locations associated with the latest of  
5 the two or more different storage times.

1 18. (Currently amended) The method of claim ~~163~~, further comprising:

2 receiving from a first server a request to create a version of a selected one of the one  
3 or more data files, and

4 based on the request:

5 for each of one or more storage times associated with the version, ~~and based~~  
6 ~~on the file identifier associated with the selected data file:~~ querying one or more indexes that  
7 associate the stored contents, the respective storage times, the respective changed locations,  
8 and ~~the respective one or more~~ respective file identifiers, to identify stored contents and  
9 respective changed locations associated the selected data file, and

10 providing the identified stored contents and respective changed locations to  
11 the first server.

PATENTS  
Attorney Docket No. NTK-006.01

1 19. (Original): The method of claim 18, further comprising:  
2 at the first server, combining the identified stored contents with data from a baseline  
3 image associated with the selected data file.

1 20. (Currently amended) The method of claim ~~163~~, further comprising:  
2 at a coalescence time, coalescing:  
3 two or more stored contents associated with the same file identifier and two  
4 or more different storage times,  
5 the respective changed locations associated with the two or more coalesced  
6 contents, and  
7 one or more indexes to associate the coalesced contents, the respective  
8 coalesced changed locations, ~~the file identifier~~ an identifier of the file with which those  
9 contents are associated, and the latest of the two or more different storage times.

1 21. (Currently amended) The method of claim ~~163~~, further comprising:  
2 at a coalescence time, coalescing:  
3 two or more stored contents associated with the same file identifier and the  
4 same storage time,  
5 the respective changed locations associated with the two or more coalesced  
6 contents, and  
7 one or more indexes to associate the coalesced contents, the respective  
8 coalesced changed locations, ~~the file identifier~~ an identifier of the file with which those  
9 contents are associated, and the same storage time.

1 22. (Original): The method of claim 21, wherein the coalescence time is based on one or  
2 more of: an actual time, a time interval, and an event.

1 23. (Original): The method of claim 22, wherein the event includes an event based on an  
2 available storage capacity of a storage medium.

PATENTS  
Attorney Docket No. NTK-006.01

1 24. (Canceled)

1 25. (Canceled)

1 26. (Canceled)

1 27. (Canceled)

1 28. (Canceled)

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1 30. (Canceled)

1 31. (Canceled)

1 32. (Canceled)

1 33. (Canceled)

1 34. (Canceled)

1 35. (Canceled)

1 36. (Canceled)

1 37. (Canceled)

1 38. (Currently amended) The ~~processor program~~storage medium of claim ~~37~~66, wherein  
2 the storage time is based on one or more of: an actual time, a time interval, and an event.

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-7-

PATENTS  
Attorney Docket No. NTK-006.01

1 39. (Canceled) The processor program of claim 37, wherein the instructions to detect  
2 changed locations include instructions to dynamically detect the changed locations in the  
3 one or more data files.

1 40. (Currently amended) The ~~processor program~~storage medium of claim 37~~64~~, wherein  
2 the instructions to store the contents include instructions to select at least one memory to  
3 store the contents.

1 41. (Currently amended) The ~~processor program~~storage medium of claim 40, wherein the  
2 instructions to select at least one memory include instructions to select the at least one  
3 memory to be distinct from a previously selected memory associated with a prior storage  
4 time.

1 42. (Canceled)

1 43. (Currently amended) The ~~processor program~~storage medium of claim 37~~66~~, wherein  
2 the instructions to ~~associate provide the associations includes include~~ instructions to  
3 generate one or more indexes to associate: the stored contents, the respective storage times,  
4 the respective changed locations, and the ~~respective one or more~~ respective file identifiers.

1 44. (Currently amended) The ~~processor program~~storage medium of claim 43, wherein the  
2 one or more indexes include:  
3 a first index to the changed locations based on the one or more file identifiers, and  
4 a second index to the stored contents based on the changed locations.

1 45. (Currently amended) The ~~processor program~~storage medium of claim 37~~64~~, further  
2 comprising instructions to use the stored contents to create a version of a selected one of the  
3 one or more data files.

PATENTS  
Attorney Docket No. NTK-006.01

1 46. (Currently amended) The ~~processor program~~storage medium of claim 45, wherein the  
2 instructions to use the stored contents to create a version include instructions to:  
3 for each of one or more storage times associated with the version, ~~and based on the~~  
4 ~~file identifier associated with the selected data file~~: query one or more indexes that associate  
5 the stored contents, the respective storage times, the respective changed locations, and the  
6 ~~respective one or more~~ respective file identifiers, to identify stored contents and respective  
7 changed locations associated with the selected data file, and  
8 combine the identified stored contents with data from a baseline image associated  
9 with the selected data file.

1 47. (Currently amended) The ~~processor program~~storage medium of claim ~~37~~64, further  
2 comprising instructions to receive from a first server a request to create a version of a  
3 selected one of the one or more data files, and  
4 based on the request:  
5 for each of one or more storage times associated with the version, ~~and based~~  
6 ~~on the file identifier associated with the selected data file~~: query one or more indexes that  
7 associate the stored contents, the respective storage times, the respective changed locations,  
8 ~~and the respective one or more~~ respective file identifiers, to identify stored contents and  
9 respective changed locations associated the selected data file, and  
10 provide the identified stored contents and respective changed locations to the  
11 first server.

1 48. (Currently amended) The ~~processor program~~storage medium of claim 47, further  
2 comprising instructions to, at the first server, combine the identified stored contents with  
3 data from a baseline image associated with the selected data file.

1 49. (Canceled)

1 50. (Currently amended) The system of claim ~~49~~69, wherein the storage time is based on  
2 one or more of: an actual time, a time interval, and an event.

PATENTS  
Attorney Docket No. NTK-006.01

1 51. (Canceled)

1 52. (Currently amended) The system of claim ~~4967~~, wherein ~~the configuration to at least~~  
2 ~~one said agent store the contents include a configuration to select~~ at least one memory to  
3 store the contents.

1 53. (Currently amended) The system of claim 52, wherein ~~the configuration to select at~~  
2 ~~least one said memory selected by at least one said agent is include a configuration to select~~  
3 ~~the at least one memory to be~~ distinct from a previously selected memory associated with a  
4 prior storage time.

1 54. (Canceled)

1 55. (Currently amended) The system of claim ~~4969~~, wherein at least one said agent  
2 provides the associations by the configuration to associate includes a configuration to  
3 generate-generating one or more indexes to associate: the stored contents, the respective  
4 storage times, the respective changed locations, and ~~the respective one or more~~ respective  
5 file identifiers.

1 56. (Original): The system of claim 55, wherein the one or more indexes include:  
2 a first index to the changed locations based on the one or more file identifiers, and  
3 a second index to the stored contents based on the changed locations.

1 57. (Currently amended) The system of claim ~~4969~~, further ~~comprising processor~~  
2 ~~instructions configured~~ to use the stored contents to create a version of a selected one of the  
3 one or more data files.



PATENTS  
Attorney Docket No. NTK-006.01

1 58. (Currently amended) The ~~processor program~~system of claim 57, wherein the ~~processor~~  
2 ~~instructions~~system is configured to use the stored contents to create a version include  
3 processor instructions ~~to by~~:

4 for each of one or more storage times associated with the version, ~~and based on the~~  
5 ~~file identifier associated with the selected data file~~: querying one or more indexes that  
6 associate the stored contents, the respective storage times, the respective changed locations,  
7 and the ~~respective~~ one or more respective identifiers, to identify stored contents and  
8 respective changed locations associated with the selected data file, and  
9 combine the identified stored contents with data from a baseline image associated  
10 with the selected data file.

1 59. (Currently amended) The system of claim 49~~69~~, further ~~comprising processor~~  
2 ~~instructions~~further configured to receive from a first server a request to create a version of a  
3 selected one of the one or more data files, and

4 based on the request:  
5 for each of one or more storage times associated with the version, ~~and based~~  
6 ~~on the file identifier associated with the selected data file~~: query one or more indexes that  
7 associate the stored contents, the respective storage times, the respective changed locations,  
8 and the ~~respective~~ one or more respective file identifiers, to identify stored contents and  
9 respective changed locations associated the selected data file, and  
10 provide the identified stored contents and respective changed locations to the  
11 first server.

1 60. (Currently amended) The system of claim 59, further ~~comprising processor~~  
2 ~~instructions~~configured to, at the first server, combine the identified stored contents with data  
3 from a baseline image associated with the selected data file.

PATENTS  
Attorney Docket No. NTK-006.01

1 61. (New) For maintaining in a backup storage system information from which a set of  
2 source files stored on a source storage system can be restored, a method that includes, for  
3 each of a sequence of storage times:

4       A)     by monitoring writes to files in the source storage system since the previous  
5               storage time, identifying locations in the source storage system where  
6               changes have been made since that previous storage time; and

7       B)     in response to thus identifying locations, storing in the backup storage  
8               system:

9               i)     contents that at that storage time occupy locations thus identified; and  
10              ii)    associations of those contents with those locations.

1 62. (New) A method as defined in claim 61 wherein the associations of the contents with  
2 the locations associate the contents with the files in the source storage system to which those  
3 contents were written.

1 63. (New) A method as defined in claim 62 further including providing in the backup  
2 storage system associations between the contents there stored and the storage times for  
3 which those contents were stored.

1 64. (New) For configuring a computer system that includes a source storage system and a  
2 backup storage system to maintain in the backup storage system information from which a  
3 set of source files stored on the source storage system can be restored, a storage medium  
4 containing instructions readable by the computer system to configure the computer system  
5 to, for each of a sequence of storage times:

6       A)     by monitoring writes to files in the source storage system since the previous  
7               storage time, identify locations in the source storage system where changes  
8               have been made since that previous storage time; and

9       B)     in response to thus identifying locations, store in the backup storage system:

10              i)     contents that at that storage time occupy locations thus identified; and  
11              ii)    associations of those contents with those locations.

PATENTS  
Attorney Docket No. NTK-006.01

1 65. (New) A storage medium as defined in claim 64 wherein the associations of the  
2 contents with the locations associate the contents with the files in the source storage system  
3 to which those contents were written.

1 66. (New) A storage medium as defined in claim 65 wherein the instructions further  
2 configure the computer system to provide in the backup storage system associations between  
3 the contents there stored and the storage times for which those contents were stored.

1 67. (New) A computer system that includes a source storage system and a backup storage  
2 system and, to maintain in the backup storage system information from which a set of source  
3 files stored on the source storage system can be restored, is configured for execution thereon  
4 of agents that together, for each of a sequence of storage times:

- 5       A)     by monitoring writes to files in the source storage system since the previous  
6             storage time, identify locations in the source storage system where changes  
7             have been made since that previous storage time; and  
8       B)     in response to thus identifying locations, store in the backup storage system:  
9             i)     contents that at that storage time occupy locations thus identified; and  
10            ii)    associations of those contents with those locations.

1 68. (New) A system as defined in claim 67 wherein the associations of the contents with  
2 the locations associate the contents with the files in the source storage system to which those  
3 contents were written.

1 69. (New) A system as defined in claim 68 wherein at least one said agent provides in the  
2 backup storage system associations between the contents there stored and the storage times  
3 for which those contents were stored.